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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,259	07/08/2003	Calvin D. VanBuskirk	T370 0002	6051

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EXAMINER
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SALDANO, LISA M

ART UNIT	PAPER NUMBER
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3673

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/614,259

Applicant(s)

VANBUSKIRK ET AL.

Examiner

Lisa M. Saldano

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 July 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 7/8/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the embodiment claimed in claims 10 and 17 wherein the soil reinforcement is not connected to the form must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claims 1, 7, 8 and 14-17 are objected to because of the following informalities:

Regarding claim 1, line 3, the applicant recites claims directed to "the structure." The term structure has not previously been used in the claim language. Please clarify the claim to state exactly what element of the invention that applicant is referring to when stating "the structure."

Regarding claims 7, 8, and 14-17, the applicant recites limitations directed to "the form." However, prior claims language from which these claims depend does not contain a form. Please clarify.

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Regarding claim 5, line 2, the phrase "like materials" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "like materials"), thereby rendering the scope of the claim(s) unascertainable.

Appropriate correction is required.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fisher (4,010,617) in view of Kennedy (CA-1,340,179).

Fisher discloses a composite arch structure, capable of functioning as an underpass structure, comprising an arched liner 1 with compacted fill material 2 thereby forming a soil arch generally indicated by 3 (see Fig.1 and column 4, lines 50-55). Fisher discloses that upon completion of the structure, the arch liner serves primarily as a lining for the structure. Fisher further discloses that the invention is based on the discovery that if the liner is permitted to settle in a controlled fashion (at a rate equal or greater than the settling of the fill material), the load pressures above the liner may be directed away from the liner to the back fill material itself (see

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column 5, lines 35-40). Fisher discloses that this behavior results in further consolidation and packing of the particles of back fill in closer and tighter formation, thereby increasing the strength of the soil arch as well as its load supporting capability. Finally, Fisher states that the disclosed soil arch structure can be made to sustain 90 percent or more of the live load, while the liner sustains 10 percent or less. Since dead load is inherently included in the weight bearing capability of the structure, the dead load is also sustained by the structure.

Regarding claim 2, Fisher discloses that the liner serves primarily as a form for the soil (see column 5, lines 7-12).

Regarding claims 7, 8, 14 and 15, Fisher discloses yielding or elastic footer means 4,5. The yielding nature of the footers constitutes a temporary footing function.

However, Fisher fails to explicitly disclose that the composite arch structure comprises reinforced soil utilizing a combination of layers of soil and reinforcement.

Kennedy discloses a soil-metal arch bridge on reinforced earth abutments comprising a metal arch 5 surrounded by soil or backfill 7 (see Fig.1 and abstract). Kennedy discloses that the metal arch is tied to the surrounding soil by layers of horizontally placed flat bars 17,19. The soil cover above the metal structure is reinforced by layers of horizontally placed flat bars 33. Kennedy discloses that tying the metal structure into the surrounding soil avoids failures (see page 7) by improving the performance of the soil backfill. Kennedy further discloses that tying the soil into the metal structure and thereby reinforcing it creates a beam action that reduces the load on the metal arch 5...consequently more load is transferred to the surrounding reinforced-soil mass (see page 11). Kennedy also discloses that reinforcing the soil around and above the metal structure by tying the metal structure to the soil provides stability of the metal arch during

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construction; adds stiffness to the soil; increases the soil's shear strength; and enhances the arch effects and activates the entire reinforced soil medium to assist in load transmission (see page 13).

Regarding claims 4 and 12, Kennedy discloses that the reinforcing flat bars for tying are preferably made from galvanized steel, which is a metal (see page 8, lines 29-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the soil arch of Fisher to include the reinforcing elements taught by Kennedy because Fisher clearly teaches that combined movement of the soil and the arch liner through equal settling directs more load to the soil medium, which occupies a larger mass and thereby would be more effective at sustaining loads. Kennedy reiterates that phenomenon and further enhances fruition of the phenomenon by providing ties for combined or inter-related movement of the metal arch and the surrounding soil medium through horizontally placed structural members.

Furthermore, although the disclosures of Fisher and Kennedy explicitly claim structures, they also disclose the basic method steps required to produce a soil arch structure as described.

Regarding claims 10 and 17, Fisher does not disclose soil reinforcement connected to the metal arch liner, but teaches coordinated movement of the arched liner and the soil medium. While Kennedy teaches combined movement of the soil and arch, he teaches connecting a reinforcing element to the lines or arch form and embedding it in the soil mass. Inasmuch as the applicant has claimed no connection of the soil reinforcement to the liner or arch, it would have been obvious to one of ordinary skill in the art to modify the invention of Fisher to include non-connected reinforcements in the soil for the purpose of integrating soil particle movement to further consolidation and packing of the particles of back fill into closer and tighter formation, as

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suggested by Fisher. Kennedy discloses a means of consolidating fill into tighter formation by embedding layers of reinforcement therein.

Regarding claim 18, both Fisher and Kennedy disclose the use of compacted soil in their inventions. Although both fail to explicitly disclose that the soil comprises mineral, mineral are inherently included in soil, which is a component of the earth's ground. The applicant is directed to the Merriam-Webster's Collegiate Dictionary, 10<sup>th</sup> edition, which states that are mineral is "any of various naturally occurring homogenous substances obtained usually from the ground."

### *Conclusion*

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Peterson (4,605,338) and Fisher (3,508,406) disclose features that are pertinent to the present application.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa M. Saldano whose telephone number is 703-605-1167. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather C. Shackelford can be reached on 703-308-2978. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

lms



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